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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/646,858

08/22/2003

Steven Lowen

04843-043001

1524

26161 7590 05/13/2008

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EXAMINER

LAMPRECHT, JOEL

ART UNIT

PAPER NUMBER

3737

MAIL DATE

DELIVERY MODE

05/13/2008

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/646,858	<b>Applicant(s)</b> LOWEN ET AL.	
	<b>Examiner</b> JOEL M. LAMPRECHT	<b>Art Unit</b> 3737	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 30 November 2007.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1,3-14,17-25 and 27-29 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1, 3-14, 17-25 and 27-29 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claim 1, 4, 5, 9-14, 17-19, 21-23, and 25, 27-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kleiman (US 6,668,184) in view of Cosman (US 6,662,036). Kleiman discloses a system and method including motion tracking elements for updating slice prescriptions of an MR scanning system during the scanning of the subject by measuring motion including the use of an optical tracking system for gathering reflected radiation via a camera device (Col 3 Line 5-15, Col 3 Line 49-Col 5 Line 15). The slice prescriptions are updated in real-time during the scanning of the subject and the relative motion between the diagnostic system and patient is accounted

for via the updating of the slice prescriptions (Col 3 line 5-15). Kleiman; however, fails to disclose a multi-camera motion tracking system, as the disclosure of Kleiman is focused on the methods for updating the protocol rather than the tracking system itself.

Attention is then directed to the secondary reference by Cosman which discloses a system for position or motion tracking wherein the positioning system uses two or more cameras, including IR cameras (Col 3 line 60-Col 4 Line 5), for tracking including integrated sources of radiation in the form of LEDs in which the camera detects light reflected from four markers (Col. 7, lines 33-45 and figure 2). Cosman explicitly discloses a variety of markers and reflectors, such as reflecting spheres, and it would be an obvious modification to use mirrors as the reflective surface disclosed by Cosman (Col. 4, lines 5-26). The system determines the position of the patient's body with respect to a treatment or imaging machine (abstract), such as an x-ray machine for diagnostic imaging, but may also be a CT, MRI, simulator, PET, or other imaging machine used in an analogous manner (Col. 11, lines 4-7). Motion may also be tracked when the patient is moved in a variety of ways, including translation in multiple directions, as shown in figure 5, and rotation, as shown in figure 1. The system may be used on any part of a patient's body, however it is explicitly shown that markers are put on both the head and chest of the patient (figures 5 and 11). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the disclosure of Kleiman in light of the reference by Cosman, as Cosman states it is advantageous to correlate scan data with camera data to enable desired positioning as well as an effective graphics display (Col. 2, lines 11-15).

Claims 3 and 24 rejected under 35 U.S.C. 103(a) as being unpatentable over Kleiman in view of Cosman as applied to claims 2 and 21 above, and further in view of Beetz, Jr., et al (US 6045677). Kleiman in view of Cosman, as discussed above, substantially disclose the invention as claimed, however fails to explicitly disclose the properties of the cameras used. However, a variety of cameras are known in the imaging art. For example, a microchannel plate is well known in the art for used in imaging apparatus (Col. 4, line 40) such as a variety of physical science instrumentation, streak cameras as they have immunity to magnetic fields (Col. 2, line 51). Therefore, such a camera would function in a magnetic resonance scanner with field strength of more than 100 Gauss without loss of accuracy. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the disclosures of Kleiman and Cosman in light of the teachings in the reference by Beetz, as it would be obviously necessary to use a camera that can withstand the field strength of an MRI if the camera system is to be used in an MRI, as disclosed by Cosman.

Claims 6 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kleiman in view of Cosman as applied to claim 5 above, and further in view of Schmitz (US 6050724). Kleiman in view of Cosman, as discussed above, substantially disclose the invention as claimed, however fail to disclose the configuration of the two cameras in relation to the imaging system. Schmitz also discloses a system using two cameras and an imaging device for position detection and further discloses that the two infrared CCD cameras are mounted to the side of the imaging system (Col. 5, lines 32-33) as shown in figure 1. The axis of the imaging system runs directly through the center of the

imaging system, therefore creating a 45-degree angle between each camera and the axis of the scanner. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the disclosure of Kleiman in view of Cosman in light of the teachings in the reference by Schmitz, as mounting the cameras on the imaging system itself advantageously eliminates one calibration or registration step, as the two systems are rigidly registered to each other.

Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kleiman in view of Cosman as applied to claim 1 above, and further in view of Nakagawa, et al (US 2002/0122117). Kleiman in view of Cosman, as discussed above, substantially discloses the invention as claimed, however fails to explicitly disclose the accuracy of the cameras used. A variety of cameras are well known in the imaging art, such as the one disclosed by Nakagawa. Nakagawa discloses a camera device for imaging which is capable of being used for accurate measurement. The CCD is capable of accuracy within 0.1mm or less (paragraph 109). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the disclosures of Kleiman and Cosman in light of the reference by Nakagawa, as it would be an obvious advantage to use a high accuracy camera, as Nakagawa states for measurement, for use in a medical or surgical system as the measurements and positioning obtained is critical to the health of the patient.

Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kleiman in view of Cosman as applied to claim 14 above, and further in view of Ward, et al ("Prospective Multiaxial Motion Correction for fMRI", Magnetic Resonance in Medicine,

2000). Kleiman in view of Cosman, as discussed above, substantially discloses the invention as claimed, however fails to disclose testing motion correction algorithms. Ward discloses a system for motion correction in an imaging system wherein testing of the system and the motion correction algorithms used is done using computerized motion phantoms. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the disclosures of Kleiman and Cosman in light of the teachings in the reference by Ward to include testing motion correction algorithms, as Ward states that motion is a known problem in MRI images and testing algorithms allow for improved motion correction of the images.

### ***Response to Arguments***

Applicant's arguments filed 11/30/07 have been fully considered but they are not persuasive. Regarding the argument that the Cosman system is unable to “determine slice and scanning data for the imaging system”, the Examiner is relying on the Kleiman reference for the purpose of updating the slice prescriptions and the Cosman reference as a source of motion tracking. Examiner has cited a number of specific locations in the newly added Kleiman reference, but recommends a full review of the patent as these citations are not meant to be a limiting admission of all that Kleiman discloses.

### ***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JOEL M. LAMPRECHT whose telephone number is (571)272-3250. The examiner can normally be reached on Monday-Friday 8:30AM-5PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian L. Casler can be reached on (571)272-4956. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.



Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Eric F Winakur/  
Primary Examiner, Art Unit 3768

JML